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December 27th, 2004

Reply to Office Action of 09/27/2004

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**Amendments to the Specification**

Please replace paragraph [0002] with the following amended paragraph:

**[0002]** Current state-of-the-art vibration detectors use fiber optic sensors mounted within the generator; usually on a stator coil end-turn. An example of a fiber optic sensor can be seen in Fig. 1. As vibrations occur, a sensor reed **14** mounted **12** within the sensor box **10** vibrates. Fixed at the end of the sensor reed is a grid **2** that physically passes through a gap 6 in a fiber optic cable **8**. As the grid vibrates at the end of the sensor reed, the light passing through the grid is amplitude and frequency modulated in a measurable manner.

Please replace paragraph [0008] with the following amended paragraph:

**[0008]** The present invention provides a configuration where all optical parts of a monitoring system are contained within a seal and within the generator itself. Non-optical preamplifier functions may also be placed within the seal. In this configuration there is an electrical rather than optical feed-through at the generator wall, which is hermetically sealed, unlike a fiber optic feed-through. The fiber optic light source and detector for each sensor are located in the seal on the generator side of the hermetic electrical feed-through. Electrical power and the sensor's converted electrical vibration signals pass through the electrical feed-through to preamplifier circuitry on the outside of the seal where a direct a—electrical connection is then made to a main chassis unit.

Please replace paragraph [0022] with the following amended paragraph:

**[0022]** The original light signal is generated within the generator side of the seal **42**. Power for this may come from a remote source, but in the embodiment shown, a power supply **44**, in particular an LED power supply, is incorporated into the outside of the seal. The power supply may be placed on the generator side of the seal, however it is appreciated that placing the power supply on the outside is

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more convenient and safer. Once a fiber optic cable transmits the original light signal to a fiber optic vibration sensor (not shown), the modified signal is carried back to a detector 46 ~~in the seal to at the seal~~. The detector converts received optical signals into electrical signals. The detector may also include preamplifier functions.

Please replace paragraph [0024] with the following amended paragraph:

**[0024]** In this embodiment the electrical signal is passed to an amplifier output 50, which in this embodiment is shown on the outside of the seal, but may also be place on the generator side. An example of an amplifier function would be to amplify a microampere signal from the receiver diode. The amplifier output can be converted to a pulse width modulation (PWM) for from about ~~-48/+48~~ -18 to +18 volts in a variety of formats. Other types of amplifiers would be apparent to one of ordinary skill in the art. Though an amplifier is one embodiment of the present invention, in may not be present in related embodiments or the amplifier function may be incorporated into other elements. The amplifier output then sends the converted information 52 from the fiber optic vibration detectors directly to a main chassis, preferably via a signal wire. Note that the main chassis unit itself may be incorporated into various operational structures, such as a monitoring computer. In a particular embodiment the amplifier also provides automatic gain control 58 for the power supply 44.

Please replace paragraph [0027] with the following amended paragraph:

**[0027]** Fig. 4 is a flow diagram of various embodiments of the present invention. An original optical signal 70 is provided from the generator side of the seal to a fiber optic vibration sensor. The signal is modified based on vibration to produce a modified signal. The modified optical signal is then sent back to the seal and converted into an electrical signal 72. At this point or at various points thereafter, the signal may be preamplified 74, amplified 80 and/or reduced from multiple

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electrical wires (from multiple signals) into fewer wires **76**. One or more electrical wires are then passed from the generator side of the seal to the outside of the seal via a hermetic seal **78**. The signal carried on the electrical wire is then exported to a monitoring device **82**, such as a local readout or a remote computer.

Please replace paragraph [0033] with the following amended paragraph:

**[0033]** In one embodiment multiple seals are used in a single generator and may share tasks. For example, all fiber optic cable cables may originate at a certain seal, but may return to through a different seal to be converted to electrical signal signals. In ~~other~~ another embodiment a fiber optic cable may originate at a place other than the seal, but will be routed to one a seal once a vibration detection signal has been produced.

Please replace paragraph [0037] with the following amended paragraph:

**[0037]** In one embodiment a control wire originating externally from the generator controls at least one device within the connector seal. If the device is on the generator side, the control wire is ~~heretically~~ hermetically passed through the seal to it.